

REMARKS

In view of the arguments herein, Applicants believes the pending application is in condition for allowance.

I. Status of the Claims

Claims 1 - 3 are currently pending.

II. Rejections under 35 U.S.C. § 102

Claims 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,798,050 to Nakamura et al. (“Nakamura”). Claims 1 - 3 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,251,440 to Bong-dong et al. (“Bong-dong”). Applicants respectfully traverse these rejections.

In independent claim 1, Applicants claim:

1. A fan revolution speed control method comprising steps of:

detecting a temperature of a cooling target fluid, and

controlling the fan revolution speed of a cooling fan of a cooling system for cooling said cooling target fluid so that:

when the flow rate of said cooling target fluid passing through said cooling system is high, the fan revolution speed of said cooling fan is controlled to achieve a target fan revolution speed in order to bring the detected temperature to the same level as a preset target temperature, and that when the flow rate of said cooling target fluid becomes lower, the fan revolution speed of the cooling fan is controlled to achieve a new target fan revolution speed that is lower than said target fan revolution speed.

(Emphasis added).

Nakamura discloses a control system for a hydraulic pump in a motor vehicle, which operates to decrease a bypass flow of a fluid in response to an increasing fluid or ambient

temperature, and thereby to increase the speed of a fan driven by a hydraulic motor powered by a non-bypass flow of the fluid in response to the increasing fluid or ambient temperature (see, e.g., Col. 4: 32 - Col. 5: 40 of Nakamura). However, and in sharp contrast to Applicants' invention as claimed in independent claim 1, Nakamura fails to disclose or suggest a fan speed control method in which the fan speed is further adjusted downward when a flow rate of the cooling fluid becomes lower. In particular, Nakamura nowhere teaches or suggests any direct relationship between fan speed and a flow rate of the cooling fluid. Accordingly, Applicants respectfully submit that independent claim 1 is not anticipated by Nakamura.

Bong-dong discloses an apparatus and method for controlling a hydraulic system for heavy construction equipment (see, e.g., abstract of Bong-dong). The control apparatus of Bong-dong monitors coolant and hydraulic fluid operating temperatures and in the event that either of these temperatures indicates an overheating condition, acts to reduce an engine speed of the heavy construction equipment (see, e.g., Col 11: 8 - Col. 12: 4 of Bong-dong). However, and in sharp contrast to Applicants' invention as claimed in independent claim 1, Bong-dong nowhere discloses that a cooling fan is part of the disclosed control apparatus, or that the control apparatus is applied to control the operation of an adjunct cooling fan.

While it may be argued that the engine described by Bong-dong must inherently be provided with a cooling fan, it is not inherent that the revolution speed of the cooling fan must be directly correlated to and follow changes in the engine speed. For example, consider conventional engine cooling fans which are electrically-powered and operate at a single speed that is independent of engine speed. Accordingly, Applicants respectfully submit that Bong-dong fails to directly or inherently anticipate Applicants' invention as claimed in independent claim 1.

In independent claim 2, Applicants claim:

2. A fan revolution speed control method comprising steps of:

detecting a temperature of hydraulic oil in a hydraulic circuit, and

controlling the fan revolution speed of a cooling fan of an oil cooler that serves to cool the return oil from a hydraulic actuator so that:

when a lever for feeding hydraulic oil to said hydraulic actuator is being operated, the fan revolution speed of said cooling fan is controlled to achieve a target fan revolution speed in order to bring the detected temperature to the same level as a preset target temperature, and that when the lever is at a neutral position, during which period supply of the hydraulic oil to said hydraulic actuator is at standstill, the fan revolution speed of said cooling fan is brought to a new target fan revolution speed that is lower than said target fan revolution speed.

(Emphasis added).

As described above, Bong-dong nowhere discloses that a cooling fan is part of the disclosed control apparatus, or that the control apparatus is applied to control the operation of an adjunct cooling fan. Moreover, Bong-dong nowhere discloses or suggests Applicants' claim step of controlling the revolution speed of a cooling fan to become lower when a supply of hydraulic oil to a hydraulic actuator in a hydraulic circuit is drawn to a standstill. Accordingly, for at least these reasons, Applicants respectfully submit that Bong-dong fails to directly or inherently anticipate Applicants' invention as claimed in independent claim 2.

The elements of Applicants' invention as claimed in independent claims 1 and 2 that distinguish over the cited references are significant. By controlling a fan revolution speed to become lower when the flow rate of either a cooling fluid or a hydraulic fluid becomes lower, Applicants' claimed method avoids overly rapid cooling of these fluids that could generate thermal strains in the cooling system and hydraulic circuit, respectively (see, e.g., Applicants' specification at page 3, line 28 through page 5, line 11).

In summary, Applicant's respectfully submit that independent claims 1 and 2 are not anticipated by either of the cited references and stand in condition for allowance. As claim 3 depends from allowable independent claim 2, Applicants further submit that dependent claim 3 is also allowable for at least this reason.

Applicants therefore respectfully request that the rejections of claims 1 - 3 under 35 U.S.C. § 102(b) be withdrawn.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

If there are any other issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: May 9, 2007

Respectfully submitted,

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